TEMPERATURE SWITCHES TSA

DESCRIPTION AND APPLICATION

These temperature switches are designed for using as two-state controllers (ON/OFF type control). They compare the temperature set-point with the actual temperature value. They cause the galvanically separated (electrically insulated) contacts of a connected relay to switch, when the set temperature is reached. The temperature set point is adjusted by a potentiometer.

Regarding sensing element location and switch application the following versions are available:

TSA 220 A – Temperature switch for sensing temperature in the switch ambient. The sensing element is placed in the metal stem of the 60 mm length.

TSA 220 K – The sensing element is placed in the metal stem for use in air condition equipment or in tubings. This temperature switch version is available with a plastic holder. Stainless steel thermowell or metal holder can be delivered as an acsessory.

TSA 220 C – The sensing element is protected by the TG 8 case, 40 mm long, and provided with a cable 1 m long. Another case type or another cable length should be specified in the order.

TSA 220 P – Contact version switch for fixing on pipeline surfaces for surface temperature measurements. The sensing element is housed in a measuring case made of metal, which is protected by a protection case made of SILIKON and SILAMID. It is delivered with the fastening strap of the length 40 cm and with closure device.

Standard temperature ranges, in which the temperature set point can be adjusted, are given in the specifications table. For the TSA 220 A the maximum allowable operation temperature is 70 °C, for the TSA 220 P this temperature limit is 110 °C. For applications above 140 °C the TSA 220 K may be used. However, in this case the switch version with the stem elongated by 60 mm and the metal centric fixing holder must be used.
These switches are designed to be used in a chemically non-aggressive environment.

ACCESSORIES

- The thermowell JS 130
- The metal central holder K 120
- The thermal conductive paste up to 200 °C, 5 g for TSA 220 P type

DECLARATION, CERTIFICATES, CALIBRATION

EC Declaration of Conformity – in accordance with Act No. 22/1997 Coll. as amended for temperature switches.
Calibration – we perform standard calibration of resistance temperature sensors in accordance with EN ISO/IEC 17025 standard in the temperature range of the stated type of sensor.

SPECIFICATIONS

BASIC DATA

Type of sensing element	Ni 1000/5000			
Operating temperature ranges (°C)	-25 to 15 °C 10 to 34 °C	0 to 40 °C 20 to 60 °C	0 to 80 °C 40 to 80 °C	60 to 140 °C 120 to 160 °C
Power supply	230 V / 50 Hz			
Maximum switched voltage	250 V AC / 6 A			
Set point adjustment failure	± 0.5 °C			
Standard hysteresis	2 °C			
Connection of the switch	according to the wiring diagram			
Recomended wire cross section	0.35 to 1.5 mm^2			
Material of the connection head	LEXAN 503RS			
Connection head dimensions	62 x 62 x 95 mm (including the control button)			
Connection head ambient temperature	-25 to 70 °C			
Ingress protection	IP 54 according to EN 60 529			
Grommet type	M 16 x 1.5			
Mass	depending on design, min. 0.2 kg			

TEMPERATURE SWITCHES TSA

ADDITIONAL DATA FOR INDIVIDUAL SENSOR TYPES

TSA 220 A

Standard length of the stem L1	60 mm
Diameter of the stem	6 + 0.2 mm
Material of the stem	stainless steel 1.4301
Switch installation	on the wall, by means of a metal holder
Maximum range of measured temperature	-25 to 70 °C

TSA 220 K

Standard length of the stem L1	70, 120, 180, 240 mm
Diameter of the stem	6 + 0.2 mm
Material of the stem	stainless steel 1.4301
Switch installation	by means of a plastic or stainless steel holder or a stainless steel thermowell
Maximum range of measured temperature	-25 to 200 °C (using an elongated stem above 120 °C)

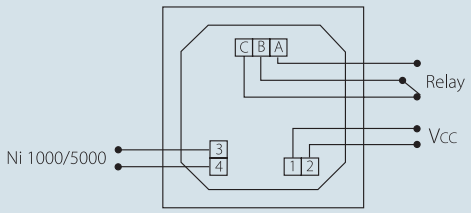
TSA 220 C

Standard type of sensor	TG 8 – 40, cable 1 m
Diameter of the case	5.7 ± 0.1 mm
Material of the case	stainless steel 1.4301
Lead-in cable	shielded silicone 2 x 0.34 mm^2
Sensor ingress protection	IP 67 according to EN 60 529
Switch installation	on the wall, by means of a metal holder
Maximum range of measured temperature	-30 to 200 °C

TSA 220 P

Material of the measuring case	brass
Switch installation	by means of fastening band with closure
Standard length of the band	40 cm
Minimum diameter of tubing	20 mm

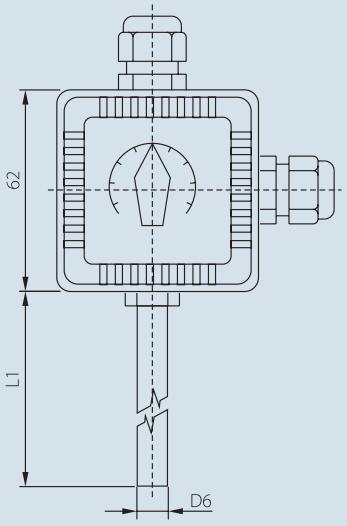
WIRING DIAGRAM



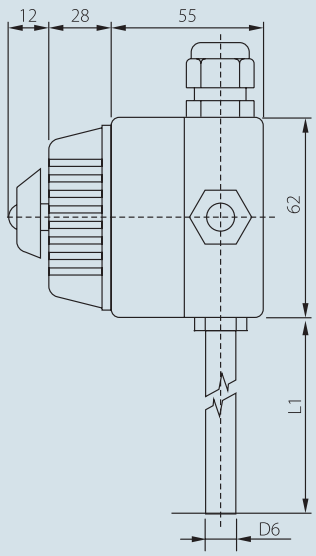
The terminal board for sensing element connection is installed for the TSA 220 C version only. The version is delivered without any sensing element or with an other type than the TG8 - 40.

DIMENSIONAL DRAFT

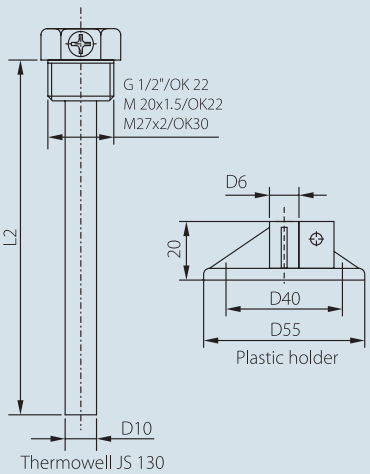
TSA 220 K – front view



TSA 220 K – lateral view



Accessory



TEMPERATURE SWITCHES TSA

OPERATION DESCRIPTION

Suppose the switching temperature set point is 20 °C. When the measured temperature value is above the set point, then the output relay's A and B terminals are closed. When the measured temperature value goes down below 18 °C, then the output relay's A and C terminals are closed. The difference of 2 °C is determined by the switch hysteresis.

SWITCH INSTALLATION AND SERVICING

Before connecting the supply lead-in cable and the cable for the relay output signal, screw off the switch's lower segment to lift it off slightly. When doing this use caution not to break the internal connecting wires. The relevant lead-in cables are pushed through the loosened grommets and connected according to the wiring diagram. The recommended wire cross section is 0.35 to 1.5 mm^2. A shielded cable has to be used when laying the lead-in cable in the vicinity of high voltage conductors or those supplying equipment generating interfering electromagnetic field (e.g. inductance type equipment). To secure a hermetic condition, the grommets has to be tightened and the switch's lower segment has to be replaced.

A component part of the TSA 220 A and the TSA 220 C switches is a metal clip making it possible to fasten the switch on plane surfaces by means of two screws. In case a stainless steel thermowell, or a centric holder are used in the TSA 220 K version, these accessories are first to be placed in locations where the temperature should be measured, then the switch has to be inserted into the holder, or at the bottom of the thermowell and then secured with the screw. The openings designed to install a plastic or a stainless steel holder are to be drilled according to the attached template, on which the opening diameters are depicted, too.

The TSA 220 P switch version is intended to be fixed on tubings by means of the fastening band and a special closing device. After installing and connecting the sensor to the appropriate evaluating electrical equipment the switch is ready to use. The switch does not require any special attendance or maintenance.

CUSTOMER SPECIFIC MODIFICATIONS

REGARDING TO SENSORS MANUFACTURED IN A STANDARD VERSION THE FOLLOWING PARAMETERS CAN BE MODIFIED:

- supply voltage 24 V AC or 24 V DC
- changing the range of temperatures to be compared
- adding a clip for fixing the device on the DIN bar instead of the metal holder for fixing the device on the wall
- removing the control button and shortening the potentiometer shaft
- in the TSA 220 A and the TSA 220 K versions changing the stem length; in the TSA 220 C changing the case and cable lengths
- customer specified stem or case design, e. g. in the fast-response TSA 220 R version
- hysteresis value modification
- the function of a differential switch